

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**LISTING OF CLAIMS:**

Claims 1-5 (Cancelled).

6. (Currently Amended) A method for monitoring a reciprocating compressor, comprising:

reading from sensors, associated with the reciprocating compressor, data corresponding to measured parameters relating to an operating state of the reciprocating compressor;

reading manually entered data corresponding to manually entered parameters relating to the operating state of the reciprocating compressor;

reading from a first database reference parameters relating to the operating state of the reciprocating compressor;

reading operating parameters of the reciprocating compressor that are calculated by a design program;

performing a first comparison between the measured parameters, the manually entered parameters, and the reference parameters and the operating parameters;

performing a second comparison between the measured parameters, the

manually entered data~~parameters~~ and absolute values~~the reference parameters~~ stored in the first database;

detecting whether an anomaly exists based on results of the first and second comparisons; and

if an anomaly is detected in the first and second comparisons, performing a search in a second database to find a match of previously stored data correlated with predetermined anomalies and corresponding characteristics of the predetermined anomalies, and sending a signal according to the match, the signal indicating characteristics of the detected anomaly of the operating state of the reciprocating compressor.

7. (Currently Amended) The method of claim 6, further comprising:  
obtaining data from design specifications of the reciprocating compressor; and  
performing a third comparison between the data from the design specifications and ~~the to the~~ data measured by the sensors to determine whether there is design conformity with the design specifications.

8. (Currently Amended) The method of claim 7, further comprising:  
receiving the results of the third comparison as inputs for ~~a the~~ design program for the reciprocating compressor, wherein outputs of ~~this the~~ design program comprises design~~the operating~~ parameters, and wherein the first comparison includes comparing the design parameters, measured parameters, manually entered parameters, and the

reference parameters.

9. (Currently Amended) The method of claim 6, wherein the second database comprises a matrix in which each row represents critical-values of the parameters relating to the operating state of the reciprocating compressor associated with a specific anomaly.

10. (Currently Amended) A system for monitoring a reciprocating compressor, comprising:

one or more sensors associated with the reciprocating compressor;  
a measuring unit configured to read data from the one or more sensors corresponding to measured parameters relating to an operating state of the reciprocating compressor; and

a processing unit coupled to the measuring unit, the processing unit configured to receive the data corresponding to the measured parameters from the measuring unit, reference parameters from a first database, ~~and~~ manually entered data corresponding to manually entered parameters, and operating parameters from a design program,

wherein the processing unit is configured to perform a first comparison between the measured parameters, the manually entered parameters, ~~and~~ the reference parameters, and the operating parameters, and to perform a second ~~configuration~~ comparison between the measured parameters, the manually entered ~~data~~ parameters and absolute values ~~the reference parameters~~ stored in the first

database,

wherein the processing unit is configured to detect an anomaly based on results of the first and second comparisons, and to perform a search in a second database to find a match of previously stored data correlated with predetermined anomalies and corresponding characteristics of the predetermined anomalies if an anomaly is detected in the first and second comparisons, and

wherein the processing unit is configured to send a signal according to the match, the signal indicating characteristics of the detected anomaly of the operating state of the reciprocating compressor.

11. (Previously Presented) The system of claim 10, wherein the processing unit is operable to obtain data from design specifications of the reciprocating compressor and to perform a third comparison between the data from the design specifications and the data measured by the sensors to determine whether there is design conformity with the design specifications.

12. (Currently Amended) The system of claim 11, wherein the processing unit is operable to receive the results of the third comparison as inputs for athe design program for the reciprocating compressor, wherein outputs of thisthe design program comprises designthe operating parameters, ~~and wherein the first comparison includes comparing the design parameters, measured parameters, manually entered parameters, and the reference parameters.~~

13. (Currently Amended) The system of claim 10, wherein the second database comprises a matrix in which each row represents critical-values of the parameters relating to the operating state of the reciprocating compressor associated with a specific anomaly.

14. (New) The method of claim 6, further comprising:  
independently performing the first and second comparisons.

15. (New) The method of claim 7, further comprising:  
displaying, based on the third comparison, an indication that at least a parameter of the reciprocating compressor is not compliant with a design specification.

16. (New) The system of claim 10, wherein the processing unit is further configured to:  
independently perform the first and second comparisons.

17. (New) The system of claim 11, wherein the processing unit is further configured to:  
generate a display signal, based on the third comparison, that is indicative that at least a parameter of the reciprocating compressor is not compliant with a design specification.

18. (New) A computer readable medium including computer executable instructions, wherein the instructions, when executed, implement a method for monitoring a reciprocating compressor, the method comprising:

reading from sensors, associated with the reciprocating compressor, data corresponding to measured parameters relating to an operating state of the reciprocating compressor;

reading manually entered data corresponding to manually entered parameters relating to the operating state of the reciprocating compressor;

reading from a first database reference parameters relating to the operating state of the reciprocating compressor;

reading operating parameters of the reciprocating compressor that are calculated by a design program;

performing a first comparison between the measured parameters, the manually entered parameters, the reference parameters and the operating parameters;

performing a second comparison between the measured parameters, the manually entered parameters and the reference parameters stored in the first database;

detecting whether an anomaly exists based on results of the first and second comparisons; and

if an anomaly is detected in the first and second comparisons, performing a search in a second database to find a match of previously stored data correlated with predetermined anomalies and corresponding characteristics of the predetermined

anomalies, and sending a signal according to the match, the signal indicating characteristics of the detected anomaly of the operating state of the reciprocating compressor.

19. (New) The medium of claim 18, further comprising:  
obtaining data from design specifications of the reciprocating compressor; and  
performing a third comparison between the data from the design specifications and the data measured by the sensors to determine whether there is design conformity with the design specifications.

20. (New) The medium of claim 19, further comprising:  
receiving the results of the third comparison as inputs for the design program for the reciprocating compressor, wherein outputs of this design program comprises the operating parameters.

21. (New) The medium of claim 18, wherein the second database comprises a matrix in which each row represents values of the parameters relating to the operating state of the reciprocating compressor associated with a specific anomaly.

22. (New) The medium of claim 18, further comprising:  
independently performing the first and second comparisons.

23. (New) The medium of claim 19, further comprising:
- displaying, based on the third comparison, an indication that at least a parameter of the reciprocating compressor is not compliant with a design specification.